

**REMARKS**

This response is to the Office Action mailed on 09/02/2010.

**From the action:**

This is non-final action in response to communication filed on 01 July 2010. Claims 19-25 is pending in the application. Claim 19-25 rejected.

The summary of an interview held with examiner on 1 July 2010 is provided. It is not necessary for applicant to provide a separate record of the substance of the interview, since the interview did not result in resolution of all issues. A brief summary by the examiner appears in Part II above.

**Applicant's response:**

Acknowledged

**From the action:**

In the response to the Election/ Restriction dated 4/2/2010, the Applicant selected group I or claims 1 - 4, 9 - 15 and 17 without traverse.

**Applicant's response:**

Acknowledged

**From the action:**

In the amendment dated 7/1/2010, the following has occurred: Claims 1 - 18 have been canceled; Claims 19 - 25 have been added. Claims 19 - 25 are pending.

**Applicant's response:**

Acknowledged

**From the action:**

The Specification uses both a Foundations Tier (FT) and a Foundations Services Tier (FST). Comparing the FT modules shown on pages 5 and 6 with the FST modules shown on page 11, the Examiner believes that FT and FST are the same.

**Applicant's response:**

The examiner is correct, and in the claim language the applicant now does not mix the terminology, using only "Foundation Services Tier".

**From the action:**

Claim 24 is objected to because of the following informalities: The Examiner believes that "than grouped" should have been "then grouped." Appropriate correction is required.

**Applicant's response:**

Claim 24 is cancelled

**From the action:**

The Examiner notes that claim 19 includes "a machine-readable physical medium." The Examiner understands that the physical medium is non-transitory.

**Applicant's response:**

The applicant notes that this comment is under a sub-heading " *Claim Rejections - 35 USC § 101*", but that the examiner states that he understands that the physical medium is non-transitory. The applicant is not sure whether a rejection has been asserted, but has nevertheless amended claim 19 to include the limitation to "non-transitory. Therefore, if a rejection was intended, it is now moot.

**From the action:**

Claims 19 - 25 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Claim 19 includes the limitation, "wherein the applications in the application services tier are business processes implemented as state machines by users interacting with the workflow SW module."

The Specification, page 19 shows (emphasis added):

*Business process in healthcare enterprises are modeled as state-machines undergoing various state changes within HMOS.* HMOs provides a Workflow Engine in DST that allows to define new business processes and link them with existing business processes. Each business process is split into different steps, called process states. Triggers that alter the state of the process are called events. Events may arise from within HMOS, through user interaction or from an external system. Change of state from one state to another is referred to as state transitions. Workflow Engine in DST provides an XML-based configuration mechanism to define process states, events and state transitions.

The Specification does not describe how to implement an application as a state machine.

**Applicant's response:**

The applicant has amended the language of this portion of claim 19 to render the objection moot. "State machine" is no longer claimed, so how a state machine is implemented is no longer pertinent.

**From the action:**

Claim 24 includes the limitations

- a. "resources are assigned security tokens listing atomic unit privileges."
- b. "the resources grouped into application roles that serve as lowest exposed units for an application configurator"

The Examiner cannot find the basis for these limitations.

Claim 25 includes the limitation, "are accessed each time data access APIs are used." The Examiner cannot find a basis requiring a backup to occur "each time" data access APIs are used.

**Applicant's response:**

Claims 24 and 25 are cancelled.

**From the action:**

Claims 19 - 25 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The claim(s) are narrative in form and replete with indefinite and functional or operational language. The structure which goes to make up the device must be clearly and positively specified. The structure must be organized and correlated in such a manner as to present a complete operative device. The claim(s) must be in one sentence form only. Note the format of the claims in the patent(s) cited.

• Regarding claim 19

The claim includes many "API" and "SW" without first what those abbreviations stand for. In particular, SW is not found within the specification.

- o The claim includes the limitation, "a domain services tier communicating with the foundation tier, the domain services tier providing APIs to access and operate on the stored information including at least a Drug Interaction Information store, patient identity management applying a unique identifier for identifying a patient across geographical barriers, using a patient identifier, a hospital identification code, and a unique geographical code, and a workflow SW engine; and"
  - The Examiner is not particularly sure how the break up the limitation into discrete units. The Examiner has made a best guess, below, however this may not be correct. The Examiner suggests rewriting the limitation to make it clearer.
  - In addition, the limitation, "using a patient identifier, a hospital identification code, and a unique geographical code, and a workflow SW engine; and" does not state how these items are used. The Examiner understands that these items are only "used" as items stored on the physical medium. Therefore, the items themselves are nonfunctional data.
- o The limitations, "foundation tier," "domain services tier," and "applications service tier" are described by limited functional actions. It is not clear where the boundaries of one functional tier end and the next begin.
- o The limitation, "wherein the applications in the application services tier are business processes implemented as state machines by users interacting with the workflow SW module." The Examiner is unsure what the Applicant intends a "state machine" to be.
  - Regarding claim 21, the claim includes, "which can be triggered across tiers or within a tier." The language appears to make the limitation optional. The Examiner understands "can be" to be "is."
  - Regarding claim 22, the claim includes

- o "QoS" It is unclear what parameters or functions the Quality of Service is guaranteeing.
  - o "the foundation tier before taking up for processing." The Examiner notes that routing the call is a processing step. The Examiner is therefore unsure as to what "taking up for processing" specifically refers.
  - o "thus guaranteeing QoS upfront instead of relying on statistical parameters after the operations." It is not clear whether this is a functional limitation of the QoS subsystem. The Examiner understands that this limitation is nonfunctional.
- Regarding claim 23, the claim includes
  - o "thus ensuring standards compliance." It is not clear whether this is a functional limitation of the "a health-care standards subsystem." The Examiner understands this to be nonfunctional descriptive information.
- Regarding claim 24, the claim includes
  - o "wherein users are assigned to non-overlapping security domains each with a different administrator," The limitation can be read that "each with a different administrator" refers to either the users or the domains. The Examiner understands that the domains have separate administrators. The Examiner suggests rewriting the limitation to include, "non-overlapping security domains, each security domain having a different administrator."
    - The Examiner understands that a domain administrator is a human. It is unclear how to require a human to perform an action.
  - o "resources are assigned security tokens listing atomic unit privileges" The Examiner is unsure whether the assignment provides functionality to the resources. The Examiner is unsure what the labeling, "atomic unit privileges" does. The tokens are not used in a later step and it is unclear how they are used in the current step. The Examiner understands this limitation to be applying labels to resources.

- o "the resources grouped into application roles that serve as lowest exposed units for an application configurator." The Examiner is unsure how a unit is "exposed" and to what comparison a exposure is "lowest."
  - The Examiner believes that a "configurator" is a small software routine. However, the Examiner is unsure whether this is what the Applicant intended as it could have been a typographical error for configuration.
- o "than grouped into business roles by the site administrators," It is not clear under what guidelines an administrator groups objects. In particular, it is not clear how one could exclude others from making and performing this human determined grouping.
- o "thus managing security authorizations across large multi-site healthcare organizations." It is not clear whether this limitation is functional. The Examiner understands this to be nonfunctional descriptive information.
- Regarding Claim 25, the claim includes
  - o "data backup and recovery functions are accessed each time data access APIs are used" The Examiner is unsure what is meant by a data access API. It can be argued that all programs use data and therefore all programs use data access.

**Applicant's response:**

Claim 19 is reproduced below as new, and before further amendment in the present response:

19. (New) A system for development of information systems for health care, comprising:

- a server coupled to a data repository;
- a software operating system executing on the server from a machine-readable physical medium, the operating system comprising:

a foundation tier providing functions at least for backup and recovery of the software operating system and its components and for messaging protocol;

a domain services tier communicating with the foundation tier, the domain services tier providing APIs to access and operate on the stored information including at least a Drug Interaction Information store, patient identity management applying a unique identifier for identifying a patient across geographical barriers, using a patient identifier, a hospital identification code, and a unique geographical code, and a workflow SW engine; and

an application service tier providing specific applications for at least admission, discharge and transfer operations, and for electronic medical record management;

wherein the applications in the application services tier are business processes implemented as state machines by users interacting with the workflow SW module, changes in state being triggered by events taking place within the operating system, external to the operating system, or by user interaction, and wherein the messaging protocol is triggered by internal events, and provides updates of states between the business processes.

The applicant asserts that this claim is certainly NOT in narrative form. The limitations are clearly indicated and separated by semicolon, as is standard in Office practice. As to the assertion that the claim must be in one-sentence form, it IS in one sentence form. There are not two or more sentences in claim 19.

As to the assertion that the structure which goes to make up the device must be clearly and positively specified, and that the structure must be organized and correlated in such a manner as to present a complete operative device, the applicant urges that that a "device" is not being claimed. What is claimed is a system comprising software (SW) executing from a non-transitory physical medium, the SW structured in distinct tiers, and providing functionality as recited. Functional and operative language is not only common in such claims but absolutely necessary in reciting the limitations. Thousands of patents have been issued by the USPTO with exactly this form of claim language, and



there is nothing at all improper about the structure of claim 19 as recited in the last response, or for that matter in the structure of claim 19 as further amended in the present response.

As to the use of SW and API, this is corrected herein by amendment to indicate that an API is an application programming interface, as is notoriously known to the skilled person, and that SW indicates software, as is also notoriously known to the skilled person.

As to the assertion that the examiner is unsure what the applicant intends a state machine to be, the applicant urges that, even though the term and concept of "state machine" is notoriously well-known in the art, the applicant has removed that particular language from the claim..

As to similar objections to language in claims 20-25, these claims are herein cancelled.

In summary for this particular rejection, the system is a software system, and is necessarily limited by the functions of the software, which does not have physical structure.

**From the action:**

**Claims 19 - 25** are rejected under 35 U.S.C. 103(a) as being unpatentable over Bowman-Amua (herein Bowman), U.S. Patent 6, 742,015 in view of Knowlton, U.S. Pre-Grant Publication 20031 0204415.

As per claim 19,  
Bowman teaches a system for development of information systems for health care, comprising:

- a server coupled to a data repository (figure 1 and column 10, lines 17 - 44);

- a software operating system executing on the server from a machine-readable physical medium, the operating system comprising (figures 10 - 13 and column 10, lines 17 - 55):
  - o a foundation tier providing functions at least (the Examiner notes that the name, "foundation tier" does not impart functionality on this tier, figure 3, #306)
    - for backup and recovery of the software operating system and its components (column 19, lines 24 - 49, backup and column 31, lines 51 - 67, base services) and
    - for messaging protocol (column 19, lines 24 - 49, report management and column 31, lines 51 - 67 communication);
  - o a domain services tier communicating with the foundation tier (The Examiner notes that the name, "domain services" does not impart functionality on this tier), the domain services tier providing APIs to access and operate on the stored information (column 35, lines 18 - 29 where APIs are standard part of Microsoft Win32 Operating System, column 52, lines 7 - 11 where SQL has built in APIs)
  - o an application service tier (column 18, line 42 - 46);
  - o wherein the applications in the application services tier are business processes implemented as state machines by users interacting with the workflow SW module (column 102, lines 9 - 25),
    - changes in state being triggered by events taking place within the operating system (column 118, lines 3 - 14),
    - external to the operating system (column 123, lines 1- 55),or

- by user interaction, and
- wherein the messaging protocol (column 51, line 65 - column 52, line 35)
- is triggered by internal events (figure 179, 17902 - 17904), and
- provides updates of states between the business processes (figure 179, 17916, response).

Bowman does not explicitly teach

- o a domain services tier communicating with the foundation tier, the domain services tier providing APIs to access and operate on the store information including at least
  - a Drug Interaction Information store,
  - patient identity management applying a unique identifier for identifying a patient across geographical barriers,
  - using a patient identifier, a hospital identification code, and a unique geographical code, and a workflow SW engine; and
- o an application service tier providing specific applications for at least admission, discharge and transfer operations, and for electronic medical record management;

However, Knowlton further teaches

- o a domain services tier communicating with the foundation tier, the domain services tier providing APIs to access and operate on the store information including at least
  - a Drug Interaction Information store (paragraph 94 and Figure 5C, allergies),

- patient identity management applying a unique identifier for identifying a patient across geographical barriers (paragraph 111, ssn),
- using a patient identifier, a hospital identification code, and a unique geographical code, and a workflow SW engine (paragraph 148, facility address and paragraph 161, zip code, figure 10E facility information); and
- o an application service tier providing specific applications for at least admission, discharge and transfer operations, and for electronic medical record management (paragraph 170, where a change in patient profile includes transfer);

It would have been obvious to one of ordinary skill in the art at the time of the invention to add these features into Bowman. One of ordinary skill in the art at the time of the invention would have added these features into Bowman with the motivation to present graphical user interface to a caregiver of the patient, and receives via the graphical user interface input data relating to a patient profile of the patient from the caregiver where the patient profile includes at least one of an objective attribute and a subjective attribute (Knowlton, paragraph 10).

However, the data is considered nonfunctional descriptive information. Substituting the claimed data for other data not claimed would be an equivalent substitution of nonfunctional data to achieve the expected result.

Throughout the Specification, the Applicant makes repeated reference to incorporation of standards. The Applicant is not claiming the invention of these standards or the use of standard in a way other than commonly accepted. Therefore, it is understood that the use of a standard in a known way produces the prima facie obvious result. Wherever above the Applicant's standard is not explicitly stated within the references, it would have been obvious to use them for their expected purpose.

As per claim 20, Bowman in view of Knowlton teaches the system of claim 19 as described above. Bowman further teaches the system wherein the messaging protocol in the foundation tier uses a Publish-Subscribe model for communication between tiers and between internal modules (column 70, lines 3 - 32), including between the applications operating in the application service tier (column 70, lines 27 - 32).

As per claim 21, Bowman in view of Knowlton teaches the system of claim 19 as described above. Bowman further teaches the system wherein

- the business processes are instantiated as state machines undergoing state transitions (column 120, line 1 - column 121, line 4),
- the workflow engine provides an XML-based configuration mechanism (column 41, lines 1 - 48) enabled for a user to define process states, events and state transitions (column 41, lines 24 - 33),
  - o which can be triggered across tiers or within a tier (column 41, lines 34 - 48 e-commerce and HL7).

As per claim 22, Bowman in view of Knowlton teaches the system of claim 19 as described above. Bowman further teaches the system wherein each call by an API is routed to a quality of service (QoS) subsystem in the foundation tier before taking up for processing (column 89, line 1 - column 90, line 32 where the QoS is based upon throughput), thus guaranteeing QoS upfront instead of relying on statistical parameters after the operations.

As per claim 23, Bowman in view of Knowlton teaches the system of claim 19 as described above.

Bowman does not explicitly teach the system wherein any application in the application service tier that requires entry of clinical terms is constrained in the workflow to route the

clinical terms through a health-care standards subsystem in the domain services tier before acceptance as clinical data, thus ensuring standards compliance.

However, Knowlton further teaches the system wherein any application in the application service tier that requires entry of clinical terms is constrained in the workflow to route the clinical terms through a health-care standards subsystem in the domain services tier before acceptance as clinical data (figure 64, ICD-9 entry). It would have been obvious to add this feature for the same reasons as described in claim 19.

As per claim 24, Bowman in view of Knowlton teaches the system of claim 19 as described above. Bowman further teaches the system comprising

- a Globally Controlled Locally Managed (GCLM) security authorization assignment and management subsystem,
  - o wherein users are assigned to non-overlapping security domains each with a different administrator (column 34, lines 30 - 34 where administrator is considered nonfunctional descriptive information and column 52 line 39 column 53, line 17 where users within a level are non-overlapping),
  - o resources are assigned security tokens listing atomic unit privileges (column 80, lines 17 - 27, keys),
  - the resources grouped into application roles that serve as lowest exposed units for an application configurator (column 289, lines 10 - 23),

Bowman in view of Knowlton do not explicitly teach:

- o resources are assigned security tokens listing atomic unit privileges,
  - the resources grouped into application roles that serve as lowest exposed units for an application configurator,
  - than grouped into business roles by the site administrators,
    - o the business roles serving as the lowest assignment units to end-users of the system, thus managing security

authorizations across large multi-site healthcare organizations.

However, it is prima facie obvious to one of ordinary skill in the art to sort items into groups by integration or separation. (see MPEP 2144.04)

As per claim 25, Bowman in view of Knowlton teaches the system of claim 19 as described above. Bowman further teaches the system wherein the data backup and recovery functions are accessed each time data access APIs are used (column 19, lines 25- 50),

The Examiner understands this limitation from the last paragraph on page 14 ending at the top of page 15. Included is, "The daily back up procedure also provides provision for integration with OLAP and other Knowledge Integration Systems, which makes them synchronized with latest data." The Examiner notes that actual integration is not required. Read broadly, "integration functionality" is a potential integration with a database.

Bowman in view of Knowlton do not explicitly teach

- and these functions provide, in addition to backup, online analytical processing (OLAP) and knowledge integration functionalities.

However, Bowman teaches online access of data (column 43). Further, Bowman teaches using online forms to process data (column 38, lines 15 - 30). It would have been obvious to one of ordinary skill in the art at the time of the invention to use existing data with existing tools to achieve the expected outcome.

**Applicant's response:**

Applicant has amended claim 19 herein to answer many objections made by the examiner, and also to render the claim far more narrow than claim 19 rejected in the outstanding action to which this response is directed.

Claim 19 as further amended in this response now recites:

19. (Currently amended) A system for developing health care applications, comprising:

- a server coupled to a data repository;

- a software system executing on the server from a non-transitory machine-readable physical medium, the software system comprising:

  - a foundation services tier (FST) providing modules with operating system functionalities including resource allocation and scheduling, and modules with middleware functionalities including messaging and knowledge integration;

  - a domain services tier (DST) comprising a workflow software (SW) engine and Application Programming Interfaces (APIs) for developing healthcare business process applications; and

    - an application service tier (AST) comprising specific healthcare business process applications developed using the workflow engine and APIs of the DST;

      - wherein the business process applications are implemented using services of a workflow engine having specific process states, and thus having state transitions, triggered by events, all defined by an XML-based configuration mechanism of the workflow engine;

      - wherein the healthcare business process applications communicate with one another in the AST using a publish-subscribe model provided by a subscription manager, in which messages are published by individual applications without address to any specific destination, and applications subscribe according to interest without regard to any specific source;

      - wherein all tasks that are to be scheduled are initiated through a scheduler function, with each defined task comprising constraints, and if the constraints cannot be satisfied within a current context, the scheduler notifies a task initiator with a precise indication of the reasons, providing Quality of Service (QoS) guarantees;

      - wherein each call to an API is routed to a Quality of Service (QoS) subsystem before being executed, and QoS standards are enforced in operation of the API and any healthcare business process application implemented through the API;



wherein, in the AST all entered data is routed through a health care standards subsystem before being accepted as clinical data, this ensuring standards compliance;

wherein user's security authorizations are managed by a Globally-Controlled Locally Managed (GCLM) system in which users are grouped into non-overlapping security domains, each managed by a security domain administrator (SDA), and users are assigned privileges defined by application designers at a lowest level of granularity; and

wherein the healthcare business process applications are developed for a specific healthcare enterprise, and after development are deployed to be executed at the specific enterprise by users who are associated with and granted privileges for that enterprise.

As claim 19 now has many more specific limitations than before the amendment in this response, the rejections of claim 19 are moot. The applicant respectfully requests that in the interest of reaching agreement on the issues and patentability, that the examiner become familiar with the content of this response and the new limitations in claim 19, and then grant an interview with applicant's representative of record, in which the applicant believes agreement may be reached as to the merits of the independent claim.

## Summary

As all of the claims, as amended and argued above, have been shown to be patentable over the art presented by the Examiner, applicant respectfully requests reconsideration and the case be passed quickly to issue.

If any fees are due beyond fees paid with this amendment, authorization is made to deduct those fees from deposit account 50-0534. If any time extension is needed beyond any extension requested with this amendment, such extension is hereby requested.

Respectfully Submitted  
Pradeep Padmakshan Achan  
By /Donald R. Boys/  
Donald R. Boys  
Reg. No. 35,074

Central Coast Patent Agency, Inc.  
3 Hangar Way, Suite D  
Watsonville, CA 95076  
(831) 768-1755